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motion as observed by Professor Tyndall on the Mer de Glace (Chamouni) was  $33\frac{3}{4}$  inches (0.85 metre) in June.

“The rate of flow, already mentioned, has an important bearing on the theory of glacier-motion. As the slope of the Jakobshavn glacier, which has the extraordinarily rapid motion of twenty metres *per diem*, is only half a degree, the fall of the bed of the valley cannot be the most important factor in the motion of glaciers. This considerable velocity must be due to the quantity of ice which has to be carried out to the fjord; or, in other words, the rate of motion is dependent on the pressure of the mass of the inland ice. Glaciers, therefore, fed from large districts of atmospheric precipitation, move with considerable velocity.”

Helland thinks it doubtful if the ice-sheet and the glaciers would form again could the land be denuded of them and left to the influences of the present climate.

The author also discusses in an interesting way the formation of cirques and lake basins in Norway and Greenland, but the views of Ramsay and others which he supports are becoming antiquated.

#### GEOGRAPHY AND EXPLORATION.

STANLEY'S JOURNEY ACROSS AFRICA. — Following the journey of Cameron across the continent of Africa from coast to coast, we have the adventurous march of Stanley, who arrived at Loanda, on the west coast, August 21st. From a *résumé* in the *Nation* we learn that he began his journey in November, 1874, at Bagamoyo, on the east coast. He was a year and a half reaching Ujiji, but meanwhile had surveyed the Victoria Nyanza, had crossed the intervening divide to the Albert Nyanza, and had explored the Alexandra Nile. He next, after visiting Lake Tanganyika, followed up the Lukuga, which Cameron had considered a genuine outlet to the lake, but which Stanley claimed was only such in exceptionally high water. In November, 1876, he set out through Uregga, crossed the left bank of the Lualaba, and passed around a series of cataracts, situated just north and south of the equator. “At  $2^{\circ}$  N. latitude the northerly course of the river bends to the northwest, then to the west, and finally to southwest, where its width is from two to ten miles, and the stream is choked with islands.” This river was called Congo by the natives. On the 8th of August, 1877, Stanley arrived at Boma, at the head of the Congo delta; on the 14th, at Cabinda, on the coast; and on the 21st at S. Paulo de Loanda. “His party (114 in number) was greatly reduced by dysentery, scurvy, and ulcers, and his last white comrade, Francis Pocock, had perished by being carried over one of the cataracts. His faithful body-servant, Kalulu, was also among the missing. The importance of Stanley's discoveries, in a geographical point of view, cannot be overestimated. They take rank among the foremost of the century, and are destined to give a new impulse and direction to exploration in Central Africa. Hitherto geographers had not conjectured that

the course of the Congo approached the equator, but it is now evident that the river can be reached by a short cut from the Albert Nyanza, or from Schweinfurth's river Welle. This stream, if it should not prove a tributary of the Congo, may not impossibly be the upper portion of the Ogove, the last great river on the West African coast whose origin is a mystery."

GEOGRAPHICAL NEWS. — A new interest in Arctic Exploration has been excited in this country by the departure of Captain Howgate's vessel, *Florence*, for Cumberland Island, the first stopping-place on the way to Smith's Sound. The *Geographical Magazine* is urging the continuance and completion of polar discovery on the part of the English government, and says that four routes now remain for future expeditions. (1.) The Jones Sound route, the work of which will be to connect North Lincoln with Aldrich's farthest, and to ascertain the limits of the Palæocrystic sea in that direction. (2.) The East Greenland route, to connect Cape Bismarck with Beaumont's farthest, and so complete the discovery of Greenland. (3.) The route of Franz Josef Land, to explore the northern side of the country discovered by Payer; and (4) the Northeast Passage, by which a knowledge of the sea north of Siberia will be completed, and Wrangell Land will be explored. On the whole the editor suggests that the East Greenland route is the best that can be selected for a new expedition. Lieutenant Weyprecht, who commanded the Austrian Polar Expedition that discovered Franz Josef Land in 1874, and Count Wilczek, one of the promoters of that expedition, have announced to the Royal Society of Meteorology of Utrecht that they intend to undertake an expedition to the Arctic regions, which will be away for about twelve months, and that they intend to establish their station of observation in one of the northern havens of Novaya Zemlya. A translation of Dr. Rink's Danish Greenland, its People and its Products, the standard work on Greenland, has been published by H. S. King & Co., London, and is a very timely work.

Several books on Turkey have appeared in London: Turkey in Europe. By James Baker. Third edition (Cassell, Petter, & Galpin, London, Paris, and New York), 1877. Travels in the Slavonic Provinces of Turkey in Europe. By G. Muir Mackenzie and A. P. Irby, with a preface by the Right Hon. W. E. Gladstone, M. P. In two volumes, second edition (London: Daldy, Isbister, & Co.), 1877. Montenegro, its People and their History. By the Rev. W. Denton, M. A. (London: Daldy, Isbister, & Co.), 1877. Handbook of the Seat of War. Edited by Alexander Mackay (London: Simkin, Marshall, & Co.), 1877.

The preservation of forests in New Zealand is attracting attention, as the colonists, by indiscriminate waste of trees, are threatening future disaster to the water supply, agriculture, and the health of the people. It appears that France has suffered cruelly from the effects of a long course of denudation, and is now trying energetically to retrieve the errors of the

past. The same may be said of the United States, though increased attention has lately been paid to the planting of new and the preservation of old forests.

### MICROSCOPY.<sup>1</sup>

THE NEW MECHANICAL FINGERS. — Several new devices for picking up and arranging diatoms, Polycystina, and other small objects have recently been described, the chief peculiarity of which consist in supporting the object from the substage, while the instrument is supported from and moved by the stage which usually bears the object-slide. By unaccountable oversight it was not stated that this expedient was the chief peculiarity of Mr. Zentmayer's mechanical finger, which was contrived in 1869, published in different journals early in the following year, and advertised and sold as a regular article of manufacture ever since. In the May number, 1870, of the *Journal of the Franklin Institute*, a cut is given of Zentmayer's invention, in which the finger is fastened to a pillar clamped to the upper plate of the mechanical stage of the microscope, while the substage is prolonged through the opening of the stage for the purpose of supporting the object. In the accompanying description Mr. Zentmayer explains that it was his object to utilize such movements of a first-class stand as were not essential for other operations connected with the use of the finger; that by attaching his apparatus to the mechanical stage he obtained sliding horizontal movements with a firmness and range not otherwise attainable; and that for the low powers employed a plain stage supported from the substage, and projecting slightly above the stage, was all that was required for holding the object and would give the necessary vertical movement to it. Mr. Zentmayer makes a special accessory to the substage for carrying the object, and a vertical adjustment to the finger itself; while subsequent experimenters have supported the object on the paraboloid or some other piece of common apparatus, and have simplified the finger by dispensing with a vertical adjustment, in both cases saving complication and expense at some loss of efficiency.

A MODIFICATION OF WENHAM'S REFLEX ILLUMINATOR. — The very ingenious and interesting reflex illuminator of Mr. Wenham was designed to avoid direct illumination by passing light into the slide at such an angle that it would be totally reflected instead of passing into air above the slide. With dry objectives, of any angle, this illumination would necessarily be exclusively reflex, since no light could pass directly to the objective; and with immersion objectives of angular aperture not greater than that corresponding to one hundred and eighty degrees dry, the result would be practically the same, as the light, after passing through a balsam-mounted object, would reach the lens at an obliquity greater than that of its extreme capacity for image-forming rays. But

<sup>1</sup> Conducted by DR. R. H. WARD, Troy, N. Y.